III. AFFECTED ENVIRONMENT

Additional information can be found in the E. Fork Coquille Watershed Analysis.

VEGETATION: The Camas Analysis Area lies within the Western Hemlock and Cool Hemlock Vegetation Zones (LSRA, 1998). The Cool Hemlock Zone generally occupies elevations above 1800' and is located along the higher south and east portions of the analysis area. Douglas-fir and western hemlock are the dominant overstory species in this zone. However, Port-Orford cedar and western red cedar may be found as overstory components. Understory species include rhododendron, Oregon grape, and salal. The Western Hemlock Zone is similar to the Cool Hemlock Zone in species composition, except, the overstory is dominated with more Douglas-fir and less hemlock. Hardwoods including big leaf maple, red alder, and golden chinkapin are more likely to be found as understory species in the Western Hemlock Zone.

Approximately 63% of the current late-successional habitat (stands greater than 80 years old) was established around 1700 and most likely initiated after large stand-replacing fires. The remaining 37% of late-successional stands were initiated between 1810 and 1890; which may have been the result of natural fires, human-caused fires, or logging. However, logging did not start in earnest until the mid 1900's, with 57% of BLM-administered lands in the analysis area harvested and replanted after 1940. These stands are the product of intensive forest management.

WILDLIFE: Numerous species of wildlife are present in the analysis area. Big game species include Roosevelt elk, black-tailed deer, black bear, and mountain lion. The area also supports populations of furbearers such as mink, long-tailed weasel, beaver, and possibly American marten and fisher. Numerous species of birds include resident and neo-tropical migratory songbirds. Upland game birds include ruffed grouse, California quail, and mountain quail. Small mammals include several species of shrews, porcupines, brush rabbits, and squirrels. Reptiles in the area include fence lizard, northern alligator lizard, probably the rubber boa, and two species of garter snake. Amphibians include southern torrent, clouded, Dunn's, western red-backed, and ensatina salamanders.

In western Oregon and Washington, snags are used by more than 90 species of wildlife, 53 of which are considered dependant on cavities. Snag surveys conducted in the East Fork Coquille Watershed (which contains the analysis area) in mid-seral stands (30-80 years old) show that snags are deficient on the north-facing slopes.

GEOLOGY /SOILS: The Camas Creek Subwatershed is overlaid with the Tyee Formation (Baldwin, 1973). This is a thick sequence of rhythmically bedded micaceous sandstone and siltstone. The formation is layered on top of the Flournoy formation in the lower reaches of Camas Creek and the west portion of the sub-watershed. The indistinct micaceous siltstone is mixed with massive beds of sandstone which are often seen as bedrock outcroppings on the landscape or in the channel bottoms. The weathering of the Tyee Formation produces much coarse sand and cobble materials in the channels. The Flournoy Formation with its siltstone component weathers to finer materials and can produce turbidity in the stream longer than that of the sandstone areas.

The soil types most common to the sub-watershed are: 14F Digger-Preacher-Umpcoos association, 15F Digger-Umpcoos-Rock Outcrop association, 46D, 46E, 46F Preacher-Bohannon loams, 50D, 50E Remote-Digger-Preacher complex, and Umpcoos-Rock Outcrop association 58F. Most of these soils formed in colluvium and residuum derived dominantly from arkosic sandstone. These soils allow for rapid infiltration, moderate amounts of water storage, and are somewhat prone to surface erosion. Soil types 14F, 15F and 58F are shallow and have somewhat reduced storage capacities when associated with high rock contents or surface bedrock. A complete discussion of the soil properties and limitations is contained in the Soil Survey of Coos Co., Oregon, 1989.

1. GEOMORPHOLOGY/HYDROLOGY/WATER QUALITY: The project area is within the South Fork Camas (3,345 acres) and East Fork Camas (5,426 acres) drainages of the East Fork Coquille watershed, and involves 11% of the drainages. Elevations in the drainages range from 1,100 to 3,100 feet. Most of the analysis area is within the transient snow accumulation zone (considered to be above 1,800 feet in the analysis area). Eighty-nine percent of the forest vegetation in the Camas subwatershed is older than 20 years of age, as the majority of the watershed was harvested during the 1960's decade (BLM, EFCWA 2000). Because of the regrowth of forests in these drainages, stream flow (annual yield) is predicted to be similar to undisturbed mature stands (Hicks et al 1991). Stream channels in the project area are generally headwater, steep cascading and step-pool channels confined by hillslopes. Drainage density is very high at 8.07 mi/mi^2. Streambed particle size distributions in Camas Creek are typical of the interaction of hillslope and fluvial processes and fine sediments in the mainstem are at or below expected amounts (BLM, EFCWA 2000). Water quality in Camas is normally excellent. In a turbidity monitoring study in the winter of 1995-6, BLM found that the water clarity seldom exceeded 10 nephelometric turbidity units (NTU). Although the East Fork Coquille River is listed for temperature on Department of Environmental Quality's 303(d) list, steam channels in the project area are generally intermittent during the summer and/or fully shaded.

FISHERIES & AQUATIC HABITAT : The Camas Creek watershed supports populations of coastal cutthroat trout, Pacific lamprey, brook lamprey, speckled dace, prickly sculpin, and reticulate sculpin. With the exception of Pacific lamprey, these are resident populations, isolated by a natural barrier downstream of the analysis area, where the E. Fork Coquille River flows through Brewster Gorge. The fish ladder constructed in Brewster Gorge in the late 1980s is not functional at present. Winter steelhead were observed in the lower portions of mainstem Camas Creek during the early 1990s when the Brewster Gorge fish ladder was functional. Juvenile coho salmon were released into Camas Creek by Oregon Department of Fish and Wildlife (ODFW) for a number of years during the late 1980s and early 1990s, but no adults were observed above Brewster Gorge during subsequent years of spawning ground surveys. The analysis area is within the Oregon Coast coho salmon Evolutionarily Significant Unit (ESU), which is listed as threatened under the Endangered Species Act (ESA). However, the project area is over 12 river miles upstream from the nearest coho salmon habitat, as illustrated in the E. Fork Coquille WA (Map A.17). Oregon Coast steelhead and coastal sea-run cutthroat trout are federal candidate species; stock status reviews are ongoing to determine if future listings may be warranted. Additional information on fish stocks can be found on pages IV-28 through IV-41 of the East Fork Coquille Watershed Analysis.

Intermittent 1st- and 2nd-order streams, seeps, or springs, and perennial 1st- and higher-order streams are present throughout the Camas Analysis Area. Both fish-bearing and non fish-bearing streams are represented. All streams analyzed are classified as small or medium non-fish, or medium fish-bearing according to 1994 Oregon Forest Practice Rules and Statutes (OAR 629-635-200).

Proposed density management thinning Units 4, 18, & 19 contain within them, or are adjacent to, fish-bearing streams containing resident cutthroat trout. All other streams within and adjacent to thinning units are non-fish bearing. This determination was based on topography and fish distribution maps, stream gradient measurements, 1999 stream habitat inventory data, and visual evaluation of critical habitat components. The upper extent of fish distribution in S. Fork Camas Creek and the two 3rd-order tributaries in T28S-R09W-27 was verified by electro-fishing during the spring of 2000.

Aquatic habitat inventory data for the analysis area is presented in the E. Fork Coquille Watershed Analysis, Appendix H, Table H.11. Table 1, Section J of the Analysis File, presents additional habitat inventory data for the analysis area, which was collected by ODFW during the summer of 1999. In summary, the 1992-99 inventories indicate that pool habitat is fairly abundant throughout the surveyed portions of Camas Creek. Most reaches that rated poor with respect to the pool area and/or pool frequency are Rosgen type A or Aa+ channels, where pools typically are not well represented due to the steep gradients. Most pools in surveyed reaches rated fair to good with respect to residual pool depth and pool complexity. Most surveyed reaches of Camas Creek have fair to good width-to-depth ratios - probably because most surveyed reaches are Rosgen A or B-type channels, which are fairly resilient with respect to width-to-depth ratio.

The most striking differences among the surveyed reaches involve the riffle substrate and large woody debris (LWD) parameters. On mainstem Camas Creek (5th order B-type channel), riffles contain very low amounts of sand, silt and organic matter, and LWD is in very low abundance. In contrast, fine sediments (silt, sand, and organic material) are abundant, even prevalent, in the riffles of its tributaries (Tables 1 & H.11, Section J of the Analysis File). These results seem to be counterintuitive, given that the surveyed tributaries are Rosgen A or Aa-type channels (which are generally considered to be high transport streams) and occur in a drainage with relatively high transport efficiency, as noted in the E. Fork Coquille Watershed Analysis, Map A.11 and Figure IV.2. High fine-sediment loading in riffles could be interpreted as the result of excessive fine-sediment delivery and/or a stream's inability to adequately sort, store, and transport sediments. However, the sorting and storage of fine sediments is a function of LWD loading in Rosgen type A and B channels; LWD generally enhances in-channel storage capacity and dissipates energy such that fine sediments are not exported as readily. LWD loading is also notably higher in the five surveyed tributaries. Thus, the disparity in riffle substrates between mainstem Camas Creek and its high-gradient tributaries appears to be attributed to differences in LWD loading.

RIPARIAN RESERVES: The Camas Analysis Area contains about 3,970 acres of interim Riparian Reserve on BLM-managed lands. The age-class distribution within the Riparian Reserve is as follows: 0-40 yrs (51%), 41-80 yrs (14%), 81-120 yrs (6%), 121-160 yrs (8%), 161-200 yrs (trace), and 200+ yrs (21%). The proposed density management treatment units and adjacent Riparian Reserves are 32 to 45-year-old managed stands that were planted after

timber harvests in the late 1950s and 1960s. These stands presently have an average density of 158-385 trees/acre, with 100% canopy closure and relative densities of 43-72. Based on research presented in Tappeiner et al. (1997), the proposed density management treatment units and the associated Riparian Reserves are not on a trajectory that is conducive to development of late-successional/old-growth forest habitat. The conditions found within these Riparian Reserves are the result of a combination of past management activities (harvest, site preparation burning, planting, precommercial thinning and fertilization) and are probably not within the range of natural variability.

While the majority of the Riparian Reserves contain low to moderate amounts of soft, embedded, down logs from previous harvest (decay class 3+); "hard" (class 1 and 2) down logs are virtually absent. Only 21% of Riparian Reserves stands in the analysis area are greater than 160 years old. It is at this age that trees reach a size that contribute appreciably to large wood recruitment to streams (Spies et al.1988). Over the next forty years, self-thinning in riparian stands 120-160 years old (8% of Riparian Reserve) should begin to provide class 1 logs to riparian forests and streams. However, because the majority of stands in the analysis area are <40 years old, it will take up to 120 years to reach optimal wood recruitment levels in Riparian Reserves. Additional information on the condition of Riparian Reserves can be found in the E. Fork Coquille Watershed Analysis (pp. V-1 - V-12) and Riparian Reserve Evaluation (pp. VII-3 - VII-26).

TRANSPORTATION SYSTEM: At present, the open road density on BLM-managed lands within the Camas Creek Subwatershed is approximately 3.64 mi/mi^2. The road systems access both federal and private lands. Consequently, the BLM has existing reciprocal right-of-way agreements with Georgia Pacific-West and Lone Rock Timber Company. These reciprocal right-of-way agreements give all land owners access to their lands, and at the same time, reduce road density by eliminating the need for duplicate road systems.

The BLM controls approximately 52% (53 miles) of the transportation system (101 miles total) in the Camas Creek Subwatershed. Approximately 85% (45 miles) of the BLM-controlled roads are either gravel or bituminous surfaced. Unsurfaced roads in the analysis area fall into two categories: either newly constructed roads or old roads in some stage of hydrologic recovery. Based on field observations, most older dirt spurs and roads on BLM-managed lands are not contributing sediment to stream channels from their surfaces.

IV. ENVIRONMENTAL CONSEQUENCES

Alternative I - No Action

Under this alternative, density management treatment to promote the development of late-successional conditions and road decommissioning would not take place at this time.

Direct, Indirect, and Cumulative Effects (Alt. I)

Development of Late-Successional Characteristics (Issue 1)

Key Indicators: Growth Rate Acceleration

The No-Action Alternative is expected to maintain the existing developmental trajectory of Riparian Reserve and upland stands that were identified and recommended for treatment in the E. Fork Coquille Watershed Analysis (pp. VIII-5 & A-26). Tappeiner et al (1997) indicates that over stocked managed stands, such as those in the analysis area, are not on a trajectory that is likely to attain desired old-growth characteristics. Successfully resetting the developmental trajectory of these stands depends on applying the appropriate silvicultural treatment within a prescribed time interval. Deferring silvicultural treatments at this time may preclude the attainment of some ACS objectives (especially #8 & 9) and the potential for these stands to acquire desired stand characteristics. The slow growth anticipated under the No-Action Alternative would result in a concomitant delay in recruitment of the desired quantity and quality of coarse woody debris to streams, and the forest floor in Riparian Reserves and uplands. It would also delay the attainment of habitat characteristics that benefit late-successional dependant species such as the northern spotted owl and marbled murrelet.

In the analysis area, approximately 715 acres of stands less than 30 years of age have been precommercially thinned. Precommercial thinning on another 62 acres is planned in the near future. The purpose of precommercial thinning is to accelerate tree growth by reducing the effects of competition. Cumulatively, this sets 777 acres on a trajectory of accelerated tree growth within LSR #261. This alternative would not contribute any additional acreage of accelerated tree growth.

Key Indicators: Understory Development

The understory component (forbs, shrubs, and seedlings) in the majority of stands proposed for density management is sparse and suppressed at present, largely due to heavy shading from closed canopies. Deferring silvicultural treatments at this time would preclude understory development for the foreseeable future. Understory development eventually creates multi-layered stands which may, in turn, maintain or enhance plant and wildlife species diversity.

Key Indicators: Stand Composition (Heterogeneity, species diversity, & structures)

Managed stands, like those being analyzed, typically have fewer tree species, more uniform tree size and spacing, and a lower number and volume of large snags and logs than their naturally generated counterparts (Spies & Franklin 1991). Snag surveys conducted in the East Fork Coquille Watershed (which contains the analysis area) in mid-seral stands (30-80 years old) show that snags are deficient on the north-facing slopes. The No-Action Alternative is expected to perpetuate the existing conditions and does not promote restoring these stands into more desirable, complex habitats. Without thinning, upland stands would remain primarily homogeneous, dominated with Douglas-fir, lacking representative proportions of other species such as hemlock, cedar, and hardwoods. The development of late-successional forest characteristics (such as large crowns, large moss-covered limbs, snags, and down logs) would be delayed. In addition, this scenario is not conducive to the attainment of the desired conditions and management objectives for Riparian Reserves in the Camas Creek

subwatershed, which are described on pp. V-4, V-12 & V-13 of the E. Fork Coquille Watershed Analysis. Key structural habitat components such as snags and down logs, which are critical for the persistence of many wildlife species, would not be created.

Past precommercial thinning created evenly spaced young stands and favored leaving Douglas-fir. This limits the development of spatial and species diversity that is desired in the LSR. The 62 acres planned for precommercial thinning would have prescriptions that promote desired stand conditions, such as leaving minor species and retaining hardwoods. This alternative would not promote development of late-successional characteristics on any additional acreage.

Roads (Issue 2)

Key Indicator: Open Road Density

Table 1: Road Density

	Alt. I	Alt. II	Alt. III
Open road density (miles/sq. mile)[2]	3.64	3.30	3.30

[2] Open roads = roads accessible to motorized vehicles. Target open road density in the FRMP is 1.1 miles/sq. mile with a maximum of 2.9 miles/sq. mile.

Road density would remain at current levels (3.64 mi/mi^2). There are no direct or indirect effects to open road density under the No-Action Alternative. Implementation of the road decommissioning/closure recommendations (specific to the Camas Analysis Area) in the E. Fork Coquille Watershed Analysis (Appendix J) would be deferred. Future road decommissioning within the Camas Analysis Area would be dependent on availability of funding from other [unspecified] sources. Some road closures are expected to occur through other management activities, such as Job-in-the-Woods. Road density on private lands may increase as new roads are constructed or old roads are reopened to harvest private lands.

Key Indicator: Impacts to Wildlife

The existing open roads within the analysis area would perpetuate the current level of disturbance to wildlife, discouraging the use of habitats adjacent to these open roads. No new roads would be constructed; therefore, no new barriers (corridors or graveled surfaces) to movement would be created. Since open road density on BLM would remain the same, the potential for loss of roadside down log habitat through theft would not change. The overall effect of the No-Action Alternative would be continued road-related disturbance to wildlife and impacts to wildlife habitat at the current level. None of the recommended road decommissioning proposed under the action alternatives would be completed at this time. Barrier effects of roads on wildlife movements will remain unchanged. Decreased connectivity of habitats (fragmentation) due to road barriers limits the ability of some wildlife species to recolonize habitats and isolates populations, making them more susceptible to local extirpation.

Alternative II - Proposed Action

Direct, Indirect, and Cumulative Effects (Alt. II)

Development of Late-Successional Characteristics (Issue 1)

Key Indicators: Growth Rate Acceleration

Numerous citings in the literature, such as Weinkel et al (1997) and Hayes et al (1997), speak to the benefits of thinning to promote late successional conditions. Thinning can move stands out of the closed-canopy stage and accelerate conditions found in late-seral forests. Some of the structural characteristics found to be lacking in young forests, but typical to older forests are large live trees, deep fissured bark, large-diameter snags, and large-diameter logs. Also lacking in young forests are multi-canopy layers composed of a well-developed understory and diverse tree species, especially the presence of hardwoods.

Stand Projection System (SPS) modeling summarized in Table E-4, Section E of the Analysis File, illustrates the acceleration in growth expected as a result of the proposed density management prescriptions. Accelerated growth would increase the quantity and quality of coarse woody debris to streams, and the forest floor in Riparian Reserves and uplands. It would also accelerate the attainment of habitat characteristics that benefit late-successional dependant species such as the northern spotted owl and marbled murrelet.

It is anticipated that these stands will require subsequent treatments before they reach 80 years of age. These future treatments, in concert with the proposed treatments, would continue the desired growth trajectory and restore managed stands into more desirable, complex habitats.

In the analysis area, approximately 715 acres of stands less than 30 years of age have been precommercially thinned. Precommercial thinning on 62 acres is planned in the near future. The purpose of precommercial thinning is to accelerate tree growth by reducing the effects of competition. This alternative would treat an additional 784 acres, accelerating tree growth on a total of 1,561 acres within LSR #261.

Key Indicators: Understory Development

Treatments result in approximately 60% canopy closure, which would facilitate understory (shrub layer) development for the first decade. A well-developed understory provides cover for birds that nest on the ground, such as the dark-eyed junco. Wilson's warblers, Swainson's thrush, and many other species build their nests in the shrub layer. Understory plants also offer forage and protective cover for many other species. Increased forage promotes the use of thinned stands by ungulates in some areas. The abundance of some species of small mammals is positively related to shrub cover in forest stands. However, the canopy is expected to close again within 15 years after treatment, which would effectively stall understory development. The proposed treatment is perceived as a first step toward attaining the desired understory characteristics described on pages V-12 & V-13 of the E. Fork Coquille Watershed Analysis.

It is anticipated that these stands will require subsequent treatments before they reach 80 years of age. These future treatments, in concert with the proposed treatments, would continue to

promote the development of shade-tolerant understory tree and shrub species typical of old-growth forest habitats in the Coast Range.

Key Indicators: Stand Composition (Heterogeneity, species diversity, & structures)

Treatments in the analysis area consist of moderate to heavy thinning, which would promote the development of species diversity. Thinning to a moderate level would aid in stimulating understory development and ground cover species, while a heavier thinning will favor the establishment and growth of conifer seedlings, shrubs and hardwoods (Hayes et al 1997). Also, selection of residual trees with less emphasis on tree spacing allows for the retention of minor conifer species and hardwoods. Proposed thinning densities vary throughout the analysis area. Variability in leave tree density, along with thinning from below (less emphasis on tree spacing), would promote heterogeneity within the stands as well as across the landscape.

Thinning would accelerate the growth of trees, thereby contributing to future recruitment of large snag and down wood. Cavity nesting birds are of a special concern for forest managers, because they require standing dead trees for nesting. Many species of cavity-nesting birds, including the chestnut-backed chickadee, red-breasted nuthatch, brown creeper and hairy woodpecker, are more abundant in old-growth forests than in young forests. The abundance of these species is associated with the abundance of large diameter snags, which cavity-nesting birds use as nesting habitat, and the abundance of large-diameter live conifers, often used for foraging. Cavity-nesting birds are abundant in stands with a diverse composition of tree species and well-developed understory vegetation. Recent studies suggest that cavity-nesting birds are more abundant in young stands that have been commercially thinned than in similar unthinned stands (Weinkel et al 1997).

Design features include: retention of existing snags and down wood, topping of trees to create additional snags, and leaving additional trees for down wood. Although the additional snag and down wood created would be small in size, they would provide short-term benefits to wildlife. After treatment, the level of snags retained would exceed the amounts recommended in the LSRA (page 82). The amount of down wood retained after treatment would be within the range expected to be found in young stands (Down Wood Calculations, Appendix 5).

Thinning in stands 30-50 years old, such as those selected for thinning in the Camas Analysis Area, promotes the restoration of old-growth stand characteristics, including development of large crowns on the dominant and co-dominant trees. Large crowns provide larger areas and nesting opportunities for birds like the marbled murrelet and habitat for the red tree vole. Nest sites of northern spotted owls (Forsman et al 1984) and marbled murrelets (Hamer and Nelson 1995) are most abundant in stands with large-diameter trees. Deep fissures in the bark, typical of old growth Douglas-fir, provide roosts for eight species of bats in western Oregon and Washington. Some species of spiders and insects are known to increase in abundance in response to thinning; spiders are an important prey item for the brown creeper.

It is anticipated that these stands will require subsequent treatments before they reach 80 years of age. These future treatments, in concert with the proposed treatments, would continue to foster species diversity, develop younger cohorts of trees to promote multi-storied canopies, and provide additional snag and down log habitats.

Past precommercial thinning in the analysis area created evenly spaced young stands which favored leaving Douglas-fir. This limits the development of spatial and species diversity that is desired in the LSR. The 62 acres planned for precommercial thinning would have prescriptions that promote desired stand conditions, such as leaving minor species. With the 784 acres treated in this alternative, a total of 846 acres would be treated to promote development of late-successional characteristics within the LSR.

Roads (Issue 2)

Key Indicator: Open Road Density

The proposed projects would include renovation/improvement of 2.3 miles of existing roads (all of which would be decommissioned after use) and decommissioning/closing an additional 2.4 miles of existing roads.

There is no new road construction associated with this alternative. The result of the proposed road decommissioning in this alternative is a reduction in open road density on BLM-managed land from 3.64 to 3.30 mi/mi^2 (Table 1, page 15) in the Camas Creek Subwatershed. This would move the road density toward the target of 1.1 mi/mi^2.

Additional road closures are expected to occur through other management activities, such as Job-in-the-Woods. These activities combined with decommissioning proposed in Alternative II further contribute to attaining the target road density on BLM. However, overall open road densities in the analysis area may not decrease if new roads are constructed or opened on private lands.

Key Indicator: Impacts to Wildlife

Overall, this alternative would provide a net benefit to wildlife, because of the amount of road decommissioning.

Alternative II would renovate/improve 2.3 miles of existing roads (all of which would be decommissioned after use) which may result in short term impacts to some less mobile wildlife species. After decommissioning, barrier effects of these roads would decrease as they revegetate and reconnect adjacent habitats.

This alternative decommissions/closes an additional 2.4 miles of existing roads. The proposed reduction in open road density would result in less disturbance to wildlife, and should allow increased utilization of available habitat. A reduction in open road density could also decrease the amount of roadside down-log habitat removed through theft.

Alternative III - Alternative Action

Direct, Indirect, and Cumulative Effects (Alt. III)

Development of Late-Successional Characteristics (Issue 1)

Key Indicators: Growth Rate Acceleration

In the analysis area, approximately 715 acres of stands less than 30 years of age have been precommercially thinned. Precommercial thinning on 62 acres is planned in the near future. The purpose of precommercial thinning is to accelerate tree growth by reducing the effects of competition. This alternative would treat an additional 491 acres, accelerating tree growth on a total of 1,268 acres within LSR #261.

All other effects to the uplands are the same as Alternative II, while the effects to the Riparian Reserve are the same as the No-Action Alternative.

Key Indicators: Understory Development

The effects to the uplands are the same as Alternative II, while the effects to the Riparian Reserve are the same as the No-Action Alternative.

Key Indicators: Stand Composition (Heterogeneity, species diversity, & structures)

Past precommercial thinning in the analysis area created evenly spaced young stands which favored leaving Douglas-fir. This limits the development of spatial and species diversity that is desired in the LSR. The 62 acres planned for precommercial thinning would have prescriptions that promote desired stand conditions, such as leaving minor species. With the 491 acres treated in this alternative, a total of 553 acres would be treated to promote development of late-successional characteristics within the LSR.

All other effects to the uplands are the same as Alternative II, while the effects to the Riparian Reserve are the same as the No-Action Alternative.

Roads (Issue 2)

Pertaining to all Key Indicators (Open Road Density, Impacts to Wildlife), the effects are the same as Alternative II.

Other Environmental Effects

None of the EA units are in or near 1) Areas of critical environmental concern, 2) Farm lands, prime or unique, 3) Flood plains, 4) Wild and scenic rivers, or 5) Wilderness values. Therefore, none of the alternatives have impacts on these resources.

Common to All Action Alternatives

Air Quality

Any prescribed burning of slash piles associated with yarding would adhere to smoke management/air quality standards of the Clean Air Act and State Implementation Plan.

Cultural Resource Values

The Camas Analysis Area probably has been the location of both prehistoric and historic cultural activities. Field reconnaissance did not reveal the presence of any cultural resources. Therefore, this project is not expected to effect prehistoric or historic cultural resources. However, if any potential cultural resources are encountered during project-related work, all work in the vicinity should stop and the District Archeologist must be notified at once.

Native American Treaty Rights

The Camas Analysis Area is within the boundaries of traditional territory described for the Coquille Indian Tribe. Although the Coquille Indian Tribe signed two treaties with the United States (in 1851 and 1855), neither were ratified by the Congress, and so are not in force. In 1996, Congress created the “Coquille Forest”, composed of fifty-four hundred acres of formerly BLM-managed land within the Coos Bay District. None of this acreage is within the analysis area. Nevertheless, the District has been involved with the Coquille Indian Tribe in the coordination of planned activities. None of the proposed alternatives are expected to affect Tribal uses.

Hazardous Materials/Solid Waste

No hazardous materials have been found to date in the action alternative units. Section R of the Analysis File contains the HazMat review. All Action Alternatives are subject to Federal and State regulatory guidelines for petroleum product use and storage. Spill Prevention, Control and Countermeasure Plans (SPCC) are required under the Oregon Forest Practices Act (Rule OAR 629-57-3600) and by Department of Environmental Quality (Rule OAR 340-108, inclusive). Spill containment capabilities on equipment sites are recommended.

Threatened and Endangered Species

The analysis area is within the range of four federally listed Threatened and/or Endangered Species: the northern spotted owl, marbled murrelet, bald eagle, and Oregon Coast coho

salmon. In addition, critical habitat for northern spotted owl and the marbled murrelet has been designated in the analysis area. Impacts to these species and their critical habitat have been addressed in consultation with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service. All mandatory terms and conditions from the Biological Opinions have been or will be incorporated/implemented in accordance with the Endangered Species Act.

Northern Spotted Owl

Density management thinning would modify foraging and dispersal habitat of eight known owl sites that have all or a portion of their home range within the Camas Analysis Area Late-Successional Reserve (LSR). Three of these owl sites have an associated alternate site center. The action alternatives of this proposal would result in a "May Affect, Not Likely to Adversely Affect" (NLAA) determination for the northern spotted owl and its designated critical habitat since suitable habitat will not be removed and/or degraded.

Marbled Murrelet

Density management thinning activities are expected to facilitate the development of future murrelet nesting habitat by increasing tree and limb growth rates. The action alternatives of this proposal would result in a "May Affect, Not Likely to Adversely Affect" (NLAA) determination for the marbled murrelet and its designated critical habitat since thinning will not remove or degrade suitable habitat and all adjacent suitable habitat will have completed two years of marbled murrelet survey protocol prior to harvest. If additional occupied behavior is detected, these sites will be delineated and affected units will be dropped or harvest season will be modified as appropriate.

Bald Eagle

No bald eagles are known to nest within the Camas Analysis Area although in the early 1990's there was an active nest documented within the East Fork Coquille watershed. All surveys to date indicate the site has most likely been abandoned. Suitable habitat is present along the East Fork Coquille River. Nests averaged 0.5 mile from water in Oregon (U.S. Fish and Wildlife Service, 1986). If it is determined that eagles are nesting within the project area, impacts will be consulted on and management recommendations will meet the objectives outlined in the 1986 Recovery Plan for the Pacific Bald Eagle.

Coho Salmon

Camas Creek is within the Oregon Coast coho salmon ESU. However, the project area is over 12 river miles upstream from the nearest coho salmon habitat, as illustrated in the E. Fork Coquille WA (Map A.17). Furthermore, the haul routes for the action alternatives are paved, except in the immediate vicinity of the density management units. Given the remoteness of the project area from the nearest coho salmon habitat, the paved haul route, protection afforded by the no-harvest buffers, consistency with the ACS objectives (see Section K), conformity with the NMFS March 18, 1997 Biological Opinion, and the additional provisions of the design features, the action alternatives were determined to have no effect on Oregon Coast coho salmon or designated critical habitat.

Essential Fish Habitat

The analysis area does not contain "Essential Fish Habitat", as defined in the Magnuson-Stevens Act. The nearest essential fish habitat is at least 12 river miles downstream from the proposed treatment units. As described in the preceding paragraph, the action

alternatives would have no effect on Oregon Coast coho salmon. Based on this information the action alternatives would not affect essential fish habitat.

Survey and Manage Species

Red Tree Vole

If required, surveys for red tree voles will be conducted using the procedures described in BLM Instruction Memorandum No. OR-2000-037. Management of known sites and new sites discovered during protocol surveys will follow the management recommendations provided in the aforementioned Instruction Memorandum or any future direction.

Del Norte Salamander

Pre-disturbance surveys are not required under the *Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standard and Guidelines* (Interagency, 2001) (S&M SEIS). However, protocol surveys for the Del Norte Salamander were completed prior to the implementation of the S&M SEIS. Suitable habitat was searched but no Del Norte salamanders were located. The analysis area is approximately 13 miles north of the known range of this salamander.

Vascular Plants, Bryophytes, Lichens, and Fungi

Protocol for surveys and management will follow the guidelines established in the S&M SEIS. Field surveys for Survey and Manage plant species (vascular plants, lichens, and bryophytes) will be done according to approved survey protocols. There are no fungi species within the analysis area that require pre-disturbance surveys under the S&M SEIS. Some surveys (for plant and fungi species) were completed prior to the implementation of the S&M SEIS. Surveys so far have located the following Survey and Manage Species: *Diplophyllum albicans* (bryophyte), *Craterellas tubaeformis* (fungi), and *Sarcosoma latahense* (fungi). Management of these and any other Survey and Manage species will follow approved management recommendations. The intent of these recommendations is to ensure local species persistence.

Noxious Weeds

Noxious weeds, such as Scotch broom, French broom, gorse, and tansy ragwort are currently scattered throughout the analysis area and occur primarily along roads and in disturbed areas. Any disturbance is likely to increase the chances of noxious weed infestation. The best management practices outlined in Partners Against Weeds - An Action Plan for the BLM, Appendix 4 (Jan. 1996), along with the design features outlined in the action alternatives (i.e., washing of vehicles prior to entry and mulching/seeding), would help prevent introduction and reduce the spread of noxious weeds.

Sensitive Plant Survey

No negative impacts are expected to any special status plant species occurring within the analysis area. Surveys for those species suspected to occur within the analysis area is currently ongoing. If locations of special status plants are found, appropriate protection measures will be implemented. A description of the special status plant pre-field review is included in Section N of the Analysis File.

Irreversible and Irretrievable Commitment of Resources

Some irreversible and irretrievable commitment of resources would result from the proposed actions. Crushed rock from quarries would be committed to reconstruction and construction of the road system. Energy used to grow, manage, and harvest trees, and in other management activities is generally irretrievable. Irreversible and irretrievable commitments as stated above are discussed in the Coos Bay District FRMP.

V. LIST OF PREPARERS

The following is a list of the Camas Analysis Area LSR EA Interdisciplinary Team members:

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